Paper ID: 33029
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14TH IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND DEVELOPMENT (D3)
Space Technology and System Management Practices and Tools (4)

Author: Dr. Christopher Moore
National Aeronautics and Space Administration (NASA), United States

PUBLIC-PRIVATE PARTNERSHIPS FOR DEVELOPMENT OF ADVANCED EXPLORATION SYSTEMS

Abstract

NASA's Advanced Exploration Systems (AES) Program is using public-private partnerships to develop and test the capabilities needed for human exploration beyond Earth orbit. Public-private partnerships amplify government investments in space technology with contributions by the private sector and stimulate the creation of new commercial markets, applications, and services. The AES Program has pioneered several different approaches for engaging in public-private partnerships. For example, Bigelow Aerospace is partnering with NASA to demonstrate an inflatable module on the International Space Station (ISS). NASA benefits from the partnership by advancing inflatable structures technology that could enable a deep space habitat, and Bigelow Aerospace benefits by applying the same technology to build a commercial space station in low Earth orbit. In another approach, the AES Program selected 12 Next Space Technologies for Exploration Partnerships (NextSTEP) to develop concepts for cis-lunar habitats and life support systems, to conduct laboratory tests of high-power electric thrusters, and to develop CubeSats that will search for lunar volatiles. The NextSTEP partnerships require at least 50 percent cost sharing from the commercial or university partners. In a third approach, the Lunar Cargo Transportation and Landing by Soft Touchdown (Lunar CATALYST) initiative is working with three companies through unfunded Space Act Agreements to enable commercial lunar payload delivery services. NASA is providing engineering expertise, test facilities, and hardware and software to help the companies develop robotic lunar landers. Then NASA plans to procure commercial services from a pool of companies having the capability to land small payloads on the Moon. Public-private partnerships are beginning to lay the foundations of the in-space infrastructure that will support human exploration and expand our economic sphere beyond Earth.